

# Climate-Smart Agriculture Practices Investment Prioritization

## Investment Prioritization for Region III: Climate Smart Varieties

### Overview

Region III is located in the central plains of Luzon. It has 2,147,036 hectares area spread in seven provinces, 14 cities and 116 municipalities, 3,102 barangays. It has a total population of 11.2M (PSA, 2015).

The region contributes almost 10% of the National Goss Domestic Product. The agricultural sector gives 17% of the regional output, employing 22% of the labor force (DA RFO III).

The province of Tarlac has a total population of 1,366,000, composed of 280,382 households. Tarlac City is the most populous while Anao is the least populous (PSA, 2015). Out of the 305,345 hectares of land in the province, 54.37% of these lands are utilized for agricultural activity.

Rice, corn, and rootcrops are the main crops cultivated in the province (Provincial Agricultural Office, 2015).

Typhoon and floods frequently visit the province. Likewise, limited access to water is a concern in areas without irrigation facilities (Philippine Rural Development Project Provincial Commodity Investment Plan, 2015). The effect of these calamities on agricultural lands is a major concern.

### Prioritized CRA Practice

Yield of some varieties is not affected by extreme changes in climatic conditions such as flooding, and drought and attack of insect pests and diseases. This justifies the increasing adoption of multi-stress, improved, disease-resistant, and or insect pest- tolerant varieties such as Green Super Rice (GSR) lines, particularly GSR8, 15, 21 and 22 as an adaptation practice to the effects of climate change.

Farmers who planted GSR lines attested the resilience of these lines to typhoon and submergence. Yield was not likewise affected.

The improved variety of corn, the BtGt (*Bacillus thuringiensis Gt)* is high in yield, resistant to corn borer, and tolerant to glyphosate/herbicide making it environment-friendly because of less pesticide usage. Yield in field trials range from 12-16 tons, an increase of 4 tons from the traditional corn variety.

### Data Gathering and Methodology

The use of multi-stress varieties in rice and corn was prioritized among the CRA practices identified during a series of focus group discussion with seventy one (71) farmer leaders, agricultural technologists and city/municipal agriculturists. This was further validated in an interview with farmers using conventional and improved varieties of rice and corn.



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Farmers growing GSR rice lines and BtGt corn varieties were asked how these varieties perform compared with the traditional varieties. Technical reports and field trials were also used to validate claims from the key informants.

In the assessment of the social benefits, technical experts were asked for their willingness-to-pay for externalities such as water availability, soil erosion prevention, social capital, and political capital using the CIAT-provided questionanire.

### Results

Farmers adopting climate smart varieties have to pay the higher prices of seeds and planting materials. But still, the higher cost was compensated for by higher and quality outputs.

Based from the current prices, results of field trials and past experiences of key informants, climate smart varieties of rice and corn, at 15% discount rate, improved variety of corn in combination with zero tillage show that it is privately profitable with $4,571.63 NPV. With an initial investment of $663.92, the payback period is 2 years. From the point of view of the society as a whole, the eventual use of CSA varieties seems to be more attractive with $9,370 SNPV.

Improved variety of rice resulted in $11,161.15, $232, 731.11 SNPV, with a payback period of 1 year.

### Recommendations

To maximize the potential of climate smart varieties, it should be implemented in combination with other practices such as crop rotation, and application of organic fertilizers. (but there is no data nor discussion about this in your results and discussion to support this claim)

More smart varieties that are both high-yielding and climate smart should be developed to raise the income of farmers and mitigate the effects of climate change in the agricultural sector.

## Summary of Results

| CBA tool summary Farm (1 ha) results | Net present value (NPV) | Internal rate of return (IRR) | Payback Period | Initial investment | Social NPV | Social IRR | Scenario in the analysis (10 years) | |
|---|---|---|---|---|---|---|---|---|
| **Unit** | US$ | % | Years | US$ | US$ | % | Before | After |
| **Value** | 11,161.15 | 15 | 1 | 28.1 | 18, 390 | - | Tradional | Improved |
| **Aggregate analysis CBA tool summary** | Total area of rice | Current adoption rate | *Adoption rate* | *Aggregated NPV* | | | Period | |
| | 2% | 2% | 5% | 803,625.09 | | | 10 | |

| Unit | US$ | % | Years | US$ | US$ | % | Before | After |
|---|---|---|---|---|---|---|---|---|
| **Value** | 4,571.63 | 126 | 2 | 663.92 | 9, 370 | - | Bt variety | BtGt variety |
| **Aggregate analysis CBA tool summary** | Total area of corn | Current adoption rate | *Adoption rate* | *Aggregated NPV* | | | Period | |
| | 14, 588 | 2% | 5% | 83,091.71 | | | 10 | |

| Unit | US$ | % | Years | US$ | US$ | % | Before | After |
|---|---|---|---|---|---|---|---|---|
| **Value** | 631, 767.26 | 15 | 3 | 993.23 | 632,518 .95 | 309 | traditional | CPM |
| **Aggregate analysis CBA tool summary** | Total area of sweetpotato | Current adoption rate | *Adoption rate* | *Aggregated NPV* | | | Period | |
| | 3,623 | 2% | 5% | 862,783.91 | | | 10 | |